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NEWS 23	MAR 06	INPADOCDB and INPAFAMDB enhanced with new display formats
NEWS 24	MAR 11	EPFULL backfile enhanced with additional full-text applications and grants
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=> s FSH and aneuploid? and diploid? and sperm
L1          17 FSH AND ANEUPLOID? AND DIPLOID? AND SPERM

=> dup rem l1
PROCESSING COMPLETED FOR L1
L2           9 DUP REM L1 (8 DUPLICATES REMOVED)

=> dis ibib abs l2 1-9

L2   ANSWER 1 OF 9  CAPLUS  COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER:         2005:122884  CAPLUS
DOCUMENT NUMBER:          142:170428
TITLE:                    Use of follicle stimulating hormone for reduction of
                          spermatozoa chromosomal aberration in males
INVENTOR(S):              De Leo, Vincenzo; La Marca, Antonio
PATENT ASSIGNEE(S):       Laboratoires Serono S.A., Switz.
SOURCE:                   PCT Int. Appl., 32 pp.
                          CODEN: PIXXD2
DOCUMENT TYPE:            Patent
LANGUAGE:                 English
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.          KIND   DATE        APPLICATION NO.        DATE
     ------------------  ----   --------    ---------------------  --------
     WO 2005011726        A1    20050210    WO 2004-EP51593        20040723
         W:  AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH,
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CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,
GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI,
NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY,
TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM,
AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE,
SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE,
SN, TD, TG

EP 1673105	A1	20060628	EP 2004-766306		20040723
EP 1673105	B1	20070502			
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, HR					
JP 2006528651	T	20061221	JP 2006-521576		20040723
AT 361092	T	20070515	AT 2004-766306		20040723
ES 2284052	T3	20071101	ES 2004-766306		20040723
US 20070037742	A1	20070215	US 2006-565763		20060605
PRIORITY APPLN. INFO.:			EP 2003-102303	A	20030725
			EP 2004-100760	A	20040226
			WO 2004-EP51593	W	20040723

AB The present invention relates to the use of a substance having a FSH activity for reducing gamete chromosomal alterations in a male, more specifically in men suffering from spermatozoa aneuploidy.

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 2 OF 9 MEDLINE on STN DUPLICATE 1

ACCESSION NUMBER:	2003481748 MEDLINE
DOCUMENT NUMBER:	PubMed ID: 14559032
TITLE:	Genetic analysis of sperm and implications of severe male infertility--a review.
AUTHOR:	Egozcue J; Blanco J; Anton E; Egozcue S; Sarrate Z; Vidal F
CORPORATE SOURCE:	Department of Cell Biology, Physiology and Immunology, Universitat Autonoma de Barcelona, 08193 Bellaterra, Spain.. josep.egozcue@uab.es
SOURCE:	Placenta, (2003 Oct) Vol. 24 Suppl B, pp. S62-5. Ref: 61 Journal code: 8006349. ISSN: 0143-4004.
PUB. COUNTRY:	England: United Kingdom
DOCUMENT TYPE:	Journal; Article; (JOURNAL ARTICLE) General Review; (REVIEW)
LANGUAGE:	English
FILE SEGMENT:	Priority Journals
ENTRY MONTH:	200406
ENTRY DATE:	Entered STN: 16 Oct 2003 Last Updated on STN: 24 Jun 2004 Entered Medline: 21 Jun 2004

AB The use of fluorescence in situ hybridization (FISH) on decondensed sperm heads has allowed to analyse the chromosome constitution of spermatozoa in different populations. In controls, the mean incidence of disomy (including all chromosomes) is about 6.7 per cent; diploidy increases with age, and some individuals may show a special tendency to nondisjunction. Carriers of numerical sex chromosome anomalies show a low incidence of sex chromosome disomies (2.54-7.69 per cent), and the need to screen ICSI candidates for these conditions has to be reconsidered. Carriers of inversions produce from 0 to 54.3 per cent abnormal sperm. Carriers of Robertsonian translocations produce from 3.4 to 36.0 per cent abnormal sperm, and carriers of reciprocal translocations produce from 47.5 to 81.0 per cent abnormal spermatozoa. However, carriers of translocations usually produce more abnormal embryos than expected from these figures. This may be partly related to

interchromosomal effects induced by some structural reorganizations. Males with oligoasthenozoospermia, low motility and/or high FSH concentrations show frequent synaptic anomalies, resulting in the production of aneuploid and diploid sperm. Testicular sperm show extremely high rates of chromosomal abnormalities. The risk of recurrent abortion is increased by the presence of chromosome abnormalities in sperm.

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ACCESSION NUMBER: 2003433662 EMBASE
TITLE: Genetic analysis of sperm and implications of severe male infertility - A review.
AUTHOR: Egozcue, Josep (correspondence); Blanco, J.; Anton, E.; Egozcue, S.; Sarrate, Z.; Vidal, F.
CORPORATE SOURCE: Department of Cell Biology, Universitat Autonoma de Barcelona, 08193 Bellaterra, Spain. josep.egozcue@uab.es
SOURCE: Placenta, (Oct 2003) Vol. 24, No. SUPPL. B, pp. S62-S65. Refs: 61
ISSN: 0143-4004 CODEN: PLACDF
COUNTRY: United Kingdom
DOCUMENT TYPE: Journal; General Review; (Review)
FILE SEGMENT: 021 Developmental Biology and Teratology
028 Urology and Nephrology
LANGUAGE: English
SUMMARY LANGUAGE: English
ENTRY DATE: Entered STN: 13 Nov 2003
Last Updated on STN: 13 Nov 2003

AB The use of fluorescence in situ hybridization (FISH) on decondensed sperm heads has allowed to analyse the chromosome constitution of spermatozoa in different populations. In controls, the mean incidence of disomy (including all chromosomes) is about 6.7 per cent; diploidy increases with age, and some individuals may show a special tendency to nondisjunction. Carriers of numerical sex chromosome anomalies show a low incidence of sex chromosome disomies (2.54-7.69 per cent), and the need to screen ICSI candidates for these conditions has to be reconsidered. Carriers of inversions produce from 0 to 54.3 per cent abnormal sperm. Carriers of Robertsonian translocations produce from 3.4 to 36.0 per cent abnormal sperm, and carriers of reciprocal translocations produce from 47.5 to 81.0 per cent abnormal spermatozoa. However, carriers of translocations usually produce more abnormal embryos than expected from these figures. This may be partly related to interchromosomal effects induced by some structural reorganizations. Males with oligoasthenozoospermia, low motility and/or high FSH concentrations show frequent synaptic anomalies, resulting in the production of aneuploid and diploid sperm. Testicular sperm show extremely high rates of chromosomal abnormalities. The risk of recurrent abortion is increased by the presence of chromosome abnormalities in sperm. .COPYRGT. 2003 Elsevier Ltd. All rights reserved.

L2 ANSWER 4 OF 9 MEDLINE on STN

ACCESSION NUMBER: 2001261803 MEDLINE
DOCUMENT NUMBER: PubMed ID: 11306798
TITLE: Meiotic segregation analysis by FISH investigation of spermatozoa of a 46,Y,der(X),t(X;Y)(qter-->p22::q11-->qter) carrier.
AUTHOR: Morel F; Fellmann F; Roux C; Bresson J L
CORPORATE SOURCE: Service de Cytogenetique-Immunocytologie-Biologie du Developpement et de la Reproduction, CECOS Besancon, Franche-Comte, Centre Hospitalier Universitaire Saint Jacques, EA 3185 Genetique et Reproduction and Faculte de

Medecine, Besancon, France.
SOURCE: Cytogenetics and cell genetics, (2001) Vol. 92, No. 1-2, pp. 63-8.
Journal code: 0367735. ISSN: 0301-0171.
PUB. COUNTRY: Switzerland
DOCUMENT TYPE: (CASE REPORTS)
Journal; Article; (JOURNAL ARTICLE)
(RESEARCH SUPPORT, NON-U.S. GOV'T)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200105
ENTRY DATE: Entered STN: 21 May 2001
Last Updated on STN: 25 Jan 2002
Entered Medline: 17 May 2001

AB Chromosome analysis performed on a 30-year-old man revealed a 46,Y,der(X),t(X;Y)(qter-->p22::q11-->qter) karyotype, confirmed by fluorescence in situ hybridization (FISH). The man was of short stature, and no mental retardation was noticed; genitalia and testes were normal, as were the patient's FSH, LH, and testosterone blood levels. Sperm analysis showed azoospermia at the time of the first sampling and severe oligozoospermia, with 125,000 spermatozoa/milliliter, at the time of the second sampling. The sperm gonosomal complement of this patient and of a 46,XY donor were analyzed using multicolor FISH with X- and Y-chromosome probes. Our results clearly indicated that germinal cells carrying the translocation are able to complete the meiotic process by producing spermatozoa compatible with normal embryonic development, with more than 80% of the spermatozoa having either a Y chromosome or a der(X); however, a high level of spermatozoa with gonosomal disomies was observed. We also found a significant increase in the frequency of autosomal disomies in the carrier, which would suggest an interchromosomal effect. All previously reported cases in adult males were associated with azoospermia; testicular histological studies, performed in patients carrying the same X;Y translocation, showed spermatogenetic arrest after pachytene. To our knowledge, this is the first molecular analysis of the gonosomal complement in spermatozoa of men with a t(X;Y)(qter-->p22::q11-->qter).

L2 ANSWER 5 OF 9 MEDLINE on STN DUPLICATE 2
ACCESSION NUMBER: 2000247304 MEDLINE
DOCUMENT NUMBER: PubMed ID: 10783364
TITLE: Chromosome analysis of spermatozoa extracted from testes of men with non-obstructive azoospermia.
AUTHOR: Martin R H; Greene C; Rademaker A; Barclay L; Ko E; Chernos J
CORPORATE SOURCE: Department of Medical Genetics, Faculty of Medicine, University of Calgary, Alberta, Canada.
SOURCE: Human reproduction (Oxford, England), (2000 May) Vol. 15, No. 5, pp. 1121-4.
Journal code: 8701199. ISSN: 0268-1161.
PUB. COUNTRY: ENGLAND: United Kingdom
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
(RESEARCH SUPPORT, NON-U.S. GOV'T)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200007
ENTRY DATE: Entered STN: 28 Jul 2000
Last Updated on STN: 13 Aug 2001
Entered Medline: 20 Jul 2000

AB Infertile men with azoospermia now have the possibility of fathering children by testicular sperm extraction combined with intracytoplasmic sperm injection. However, there are concerns about the risk of chromosomal abnormalities in their spermatozoa. We have

studied aneuploidy frequencies for chromosomes 13, 21, X and Y by multicolour fluorescence in-situ hybridization (FISH) in testicular spermatozoa extracted from three men with non-obstructive azoospermia. The men were 34-37 years of age and had normal follicle-stimulating hormone (FSH) concentrations and normal 46,XY somatic karyotypes. A total of 3324 spermatozoa was analysed. The infertile patients had an elevated frequency of disomy for chromosomes 13, 21, XY disomy compared to controls but none of these reached statistical significance. Also there was no significant difference in the sex ratio or the frequency of diploidy in azoospermic patients compared to normal control donors. This first report on chromosomal aneuploidy in spermatozoa extracted from testes of patients with non-obstructive azoospermia suggests that some azoospermic men do not have a substantially increased risk of chromosomally abnormal spermatozoa.

L2 ANSWER 6 OF 9 MEDLINE on STN DUPLICATE 3
ACCESSION NUMBER: 2000174998 MEDLINE
DOCUMENT NUMBER: PubMed ID: 10711834
TITLE: Human male infertility: chromosome anomalies, meiotic disorders, abnormal spermatozoa and recurrent abortion.
AUTHOR: Egozcue S; Blanco J; Vendrell J M; Garcia F; Veiga A; Aran B; Barri P N; Vidal F; Egozcue J
CORPORATE SOURCE: Departament de Biologia Cellular, Universitat Autonoma de Barcelona, Bellaterra, Spain.
SOURCE: Human reproduction update, (2000 Jan-Feb) Vol. 6, No. 1, pp. 93-105. Ref: 146
Journal code: 9507614. ISSN: 1355-4786.
PUB. COUNTRY: ENGLAND: United Kingdom
DOCUMENT TYPE: (CASE REPORTS)
Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200004
ENTRY DATE: Entered STN: 27 Apr 2000
Last Updated on STN: 27 Apr 2000
Entered Medline: 19 Apr 2000

AB Human male infertility is often related to chromosome abnormalities. In chromosomally normal infertile males, the rates of chromosome 21 and sex chromosome disomy in spermatozoa are increased. Higher incidences of trisomy 21 (seldom of paternal origin) and sex chromosome aneuploidy are also found. XXY and XYY patients produce increased numbers of XY, XX and YY spermatozoa, indicating an increased risk of production of XXY, XYY and XXX individuals. Since XXYs can reproduce using intracytoplasmic sperm injection (ICSI), this could explain the slight increase of sex chromosome anomalies in ICSI series. Carriers of structural reorganizations produce unbalanced spermatozoa, and risk having children with duplications and/or deficiencies. In some cases, this risk is considerably lower or higher than average. These patients also show increased diploidy, and a higher risk of producing diandric triploids. Meiotic disorders are frequent in infertile males, and increase with severe oligoasthenozoospermia (OA) and/or high follicle stimulating hormone (FSH) concentrations. These patients produce spermatozoa with autosomal and sex chromosome disomies, and diploid spermatozoa. Their contribution to recurrent abortion depends on the production of trisomies, monosomies and of triploids. The most frequent sperm chromosome anomaly in infertile males is diploidy, originated by either meiotic mutations or by a compromised testicular environment.

L2 ANSWER 7 OF 9 MEDLINE on STN
ACCESSION NUMBER: 1998401619 MEDLINE

DOCUMENT NUMBER: PubMed ID: 9731432
TITLE: [Contribution of chromosomal abnormalities to in vitro fertilization failures].
Contribucion de las anomalias cromosomicas ovocitarias en el fracaso de la fecundacion humana in vitro.
AUTHOR: Smith R; Walker L; Cobo A C; Vantman D
CORPORATE SOURCE: Instituto de Investigaciones Materno-Infantil, Facultad de Medicina, Universidad de Chile, Santiago, Chile.
SOURCE: Revista medica de Chile, (1998 May) Vol. 126, No. 5, pp. 511-9.
Journal code: 0404312. ISSN: 0034-9887.
PUB. COUNTRY: Chile
DOCUMENT TYPE: (ENGLISH ABSTRACT)
Journal; Article; (JOURNAL ARTICLE)
(RESEARCH SUPPORT, NON-U.S. GOV'T)
LANGUAGE: Spanish
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199811
ENTRY DATE: Entered STN: 6 Jan 1999
Last Updated on STN: 25 Jan 2002
Entered Medline: 3 Nov 1998

AB BACKGROUND: Present knowledge of mechanisms involved in human fertilization has uncovered a new group of pathologic conditions that have been generically named fertilization abnormalities. AIM: To determine the contribution of chromosomal alterations to in vitro fertilization failures. MATERIALS AND METHODS: A cytogenetic analysis of oocytes that were not fertilized after insemination with normal spermatozoa. Oocytes were obtained from patients subjected to in vitro fertilization in a public hospital of Metropolitan Santiago. Ovulation was induced in these patients administering GnRh-a, FSH, HMG and HCG. The double fixation technique described by Wramsby was used to obtain chromosomes. RESULTS: One hundred and seven oocytes coming from 45 women aged 25 to 42 years old were studied. The frequency of aneuploidy in these oocytes was 37.3%, with a 11.8% of hypohaploidy, a 21.6% of hyperhaploidy and a 3.9% of diploid oocytes. In hyperhaploid as well as in hypohaploid oocytes, the chromosomes involved in aneuploidy pertained to groups D. and G. CONCLUSIONS: Although the total frequency of aneuploidy is within normal ranges, the frequency of hyperhaploidy is superior to previous reports. An explanation for this finding could be that the occurrence of a lack of disjunction with chromosomal retention in the parental cell occurs with a higher frequency than that in which the chromosomes are retained in the polocyte. We also suggest that oocyte chromosomal aneuploidy could contribute to the failure of in vitro fertilization procedures.

L2 ANSWER 8 OF 9 MEDLINE on STN DUPLICATE 4
ACCESSION NUMBER: 1997384586 MEDLINE
DOCUMENT NUMBER: PubMed ID: 9240254
TITLE: Age-related decline in fertility: a link to degenerative oocytes?.
AUTHOR: Lim A S; Tsakok M F
CORPORATE SOURCE: Department of Obstetrics and Gynecology, Singapore General Hospital, Singapore.
SOURCE: Fertility and sterility, (1997 Aug) Vol. 68, No. 2, pp. 265-71.
Journal code: 0372772. ISSN: 0015-0282.
Report No.: PIP-126799; POP-00268183.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals; Population
ENTRY MONTH: 199708

ENTRY DATE: Entered STN: 8 Sep 1997
Last Updated on STN: 1 Nov 2002
Entered Medline: 25 Aug 1997

AB OBJECTIVE: To determine whether the age-related decline in fertility is due to degenerative oocytes or to aneuploidy. DESIGN: Retrospective. SETTING: Fertility center of a public and tertiary institution. PATIENT(S): One hundred fifty-one women (ages 24 to 44 years) undergoing 158 cycles of conventional IVF or IVF with intracytoplasmic sperm injection (ICSI) between January 1993 and December 1995 were divided into three age groups (group 1, < or = 34 years; group 2, between 35 and 39 years; and group 3, > or = 40 years). They were selected on the basis of available oocytes that remained unfertilized after IVF and that had analyzable chromosomes. INTERVENTION(S): Standard pituitary down-regulation and ovarian stimulation with FSH and hMG were done for both IVF and ICSI patients. In addition, all patients were given luteal phase support with P, administered orally, via pessaries, or by IM injections from the day of transfer. MAIN OUTCOME MEASURE(S): Fertilization rates and pregnancy rates (PRs), and cytogenetic analyses of unfertilized oocytes. RESULT(S): Although fertilization rates were not different among women in groups 1, 2, and 3 (50.9%, 49.3%, and 37.9%, respectively), PRs were significantly lower between groups 1 and 3 (43.2% versus 14.3%). A total of 383 oocytes were examined, of which 287 (75%) could be karyotyped. Of these, 201 oocytes showed a normal 23,X karyotype (70%), 40 (13.9%) were aneuploid, 24 (8.4%) were diploid, 12 (4.2%) had structural aberrations, and 13 (4.5%) had single chromatids only. No increase in the aneuploidy rate was detected between groups 1 and 2 (14.8% versus 12.4%). However, highly significant differences in the rate of oocyte chromosome degeneration, characterized by chromosomes splitting into unassociated chromatids, were observed with increasing age (group 1, 23.7%; group 2, 52.0%; and group 3, 95.8%). CONCLUSION(S): It seems that the age-related decline in fertility may be due more to degenerative oocytes than to aneuploidy. A decline in the number of oocytes retrieved with age may be of less importance than the decline in oocyte quality. Women in the older age group have a higher chance of achieving pregnancy from ovum-donation programs than by persisting in using their own aged oocytes, which have a very poor prognosis for success. The hypothesis that the fertility decline observed in women over 40 years old is linked more to degenerative oocytes than to age-associated aneuploidy was investigated in 151 women 24-44 years old who underwent a total of 158 in vitro fertilization (IVF) cycles at Singapore General Hospital during 1993-95. Fertilization rates were 50.9% in women 34 years or younger, 49.3% in those 35-39 years old, and 37.9% in women 40 years or older. The pregnancy rates were 43.2%, 32.7%, and 14.3%, respectively. 287 (74.9%) of the 383 unfertilized oocytes could be karyotyped fully. The total chromosome abnormality rate was 30.3%; this included aneuploidy (13.9%), diploidy (8.4%), structural aberrations (4.2%), and single chromatids only (4.5%). A relationship between increased maternal age and an increase in the aneuploidy rate could not be assessed because of the small sample size in the oldest age group. The rate of chromatid separation increased significantly from 23.8% in the youngest age group to 95.8% in the oldest age group. This rate did not differ between in vitro fertilization and intracytoplasmic sperm injection. The degeneration evident in the majority of oocytes of older women presumably reflects decades of metabolic arrest at the dictyate stage. These findings suggest that the decline in the number of oocytes retrieved with age may be of less importance than the decline in oocyte quality. Women in the older age group have a greater likelihood of achieving pregnancy from ovum donation programs.

L2 ANSWER 9 OF 9 MEDLINE on STN

ACCESSION NUMBER: 1989008775 MEDLINE
DOCUMENT NUMBER: PubMed ID: 3139703
TITLE: Chromosome anomalies in human oocytes failing to fertilize after insemination in vitro.
AUTHOR: Bongso A; Chye N S; Ratnam S; Sathananthan H; Wong P C
CORPORATE SOURCE: Department of Obstetrics and Gynaecology, National University of Singapore.
SOURCE: Human reproduction (Oxford, England), (1988 Jul) Vol. 3, No. 5, pp. 645-9.
Journal code: 8701199. ISSN: 0268-1161.
PUB. COUNTRY: ENGLAND: United Kingdom
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 198811
ENTRY DATE: Entered STN: 8 Mar 1990
Last Updated on STN: 8 Mar 1990
Entered Medline: 3 Nov 1988

AB Three-hundred-and-two unfertilized oocytes left over from successful in-vitro fertilization (IVF) attempts in 143 women (27-42 years) on a follicular stimulating hormone-human menopausal gonadotrophin (FSH -HMG) stimulation regime were subjected to chromosome analysis. Ten oocytes were degenerated with no visible chromosomes and 41 metaphases had chromosomes that were clumped together which could not be interpreted either numerically or structurally. Of the remaining oocytes, 76.6% (192/251) had a normal haploid complement (n = 23), 13% (33/251) were hypohaploid (n = 19-22), 8% (20/251) were hyperhaploid (n = 24-26), 2% (5/251) were diploid (2n = 46) and 0.4% (1/251) had structural rearrangements. The 21% aneuploidy was from 24 different patients and hypohaploid sets had chromosomes missing mainly from the A, B, C, D and G groups while the hyperhaploid sets had extra chromosomes from A, B, D, G and E groups of the human karyotype. The mean age of patients showing aneuploid oocytes was 36.7 years which was above the mean for the entire group. The aneuploidy may have been brought about by errors in oogenesis (anaphase lagging or non-disjunction) and may offer one explanation for fertilization failure and overall low pregnancy rates after IVF.